## REMARKS

In the final Official Action dated June 24, 2002, claims 1-13 were rejected under 35 U.S.C. § 112, first paragraph, as the Examiner fails to find support within the specification for "high speed signal"; claims 1-13 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite; claims 1-3, 5-8 and 10-12 were rejected under 35 U.S.C. § 102(e) as being anticipated by Pelc et al.; and claims 4 and 9 were rejected under 35 U.S.C. 103(a) as being unpatentable over Pelc in view of Kelly et al.

By this response, claims 1, 3 and 5 are amended, claims 6-13 are canceled, and claims 14-44 are added. Claims 1-5 and 14-44 are now active in this application. No new matter has been added.

As to the rejection of claims 1-3, and 5 under 35 U.S.C. 102(e) as being anticipated by Pelc et al., Claim 1 is amended to distinguish over this reference. Amended claim 1 now requires, *inter alia*, that an inner space defined by the pipette and the piston is directly coupled to the nozzle. On the other hand, in the microvolume liquid handling system of Pelc et al., the inner space defined by the syringe 32 and the plunger 34 in the positive displacement pump 12 is coupled to the nozzle 63 through the valve 38, the pressure sensor 14, and the distribution tubes 18, as shown in Fig. 1 of the reference. In Fig. 7 of the reference, the pressure control system 218 is coupled to the nozzle through the system liquid reservoir 214, distribution tubes 234, sections 236, microdispensors 212 at least. Therefore, the pipetting apparatus defined by amended claim 1 is totally different from the arrangement of Pelc et al.

Moreover, Pelc et al. fails to disclose the piston fluid-tightly sliding along an inner wall of the pipette. Thus, amended independent claim 1, as well as dependent claims 2-5, are patentable over Pelc et al., even when considered in view of Kelly et al.

New claim 14, depending from claim 1, features that the liquid is sucked into the inner space defined by the pipette and the piston in accordance with the position of the piston. On the other hand, in Pelc et al., the system liquid (not transfer liquid) is introduced into the syringe 32 with plunger 34, as shown in Figs. 1 and 2. In Fig. 7 of Pelc et al., the pressure control system 218 does not aspirate the system liquid, so that the transfer liquid is not introduced into the inner space defined by the pressure control system 218. Therefore, new claim 14 is totally different from the arrangement of Pelc et al.

New claim 15, depending from claim 1, features that a position at which the piston fluid-tightly slides along the inner wall of the pipette is movable to the pipette along the inner surface. On the other hand, the position of fluid-tight contact between the syringe 32 and the plunger 34 is fixed with reference to the syringe 32 because there is no piston in syringe 32, as shown in Fig. 2 of Pelc et al.

New claim 16, depending from claim 1, features that the first speed is sufficiently low to prevent the air from entering the inner space through a space that would be made between the piston and the inner wall of the pipette while the liquid is sucked into the pipette. This is supported at page 7, line 10-17 of the present application. On the other hand, in Pelc et al., because there is no piston, the air does not enter the inner space through the space that would be made between the piston and the inner wall of the pipette while the liquid is aspirated. Therefore, claim 16 is also totally different from the arrangement of Pelc et al.

New claim 17, depending from claim 1, features that the supporting means supports the pipette holding means, the piston holding means, and the position changing means. This is supported at page 6, lines 11- 14 of the present application. Pelc et al. fails to disclose this feature. Therefore, claim 17 is totally different from the arrangement of Pelc et al.

New claim 18, depending from claim 17, features that the supporting means is capable of being hand-held. New claim 19, depending from claim 17, features that the supporting means is capable of being hand-held by a robot arm. These features are supported at page 6, lines 11-22 of the present application. Pelc et al. fails to disclose these features. Therefore, claims 18 and 19 are totally different from the arrangement of Pelc et al.

New claim 20, depending from claim 1, features that the pipette is replaceable with the pipette holding means, and the piston is replaceable with the piston holding means. Pelc et al. fails to disclose this feature. Therefore, claim 20 is totally different from the arrangement of Pelc et al.

New independent claim 21 features that an inner space defined by the pipette and the piston is directly coupled to the nozzle. On the other hand, in the microvolume liquid handling system of Pelc et al., the inner space defined by the syringe 32 and the plunger 34 in the positive displacement pump 12 is coupled to the nozzle 63 through the valve 38, the pressure sensor 14, and the distribution tubes 18, as shown in Fig. 1 of the reference. In Fig. 7 of the reference, the pressure control system 218 is coupled to the nozzle through the system liquid reservoir 214, distribution tubes 234, sections 236, microdispensors 212 at least. Therefore, the pipetting apparatus defined by independent claim 21 is totally different from the arrangement of Pelc et al.

Moreover, Pelc et al. fails to disclose also the piston fluid-tightly sliding along an inner wall of the pipette.

Further, new claim 21, depending from claim 22, features that position changing means includes a linear pulse motor for changing a position of the piston with the piston holding means in response to a pulse signal. Pelc et al. fails to disclose this feature.

New independent claim 31 features that an inner space defined by the pipette and the piston is directly coupled to the nozzle. Pelc et al. fails to disclose this feature. Therefore, the pipetting apparatus defined by independent claim 31is totally different from the arrangement of Pelc et al.

Moreover, the reference Pelc et al. fails to disclose the piston fluid-tightly sliding along an inner wall of the pipette. The reference Pelc et al. fails to disclose this feature.

Further, new independent claim 31 features also that position changing means includes a motor and piezoelectric actuator for changing a position of the piston with the piston holding means. The piezoelectric actuator is used to jet a portion of a liquid in the pipette through the nozzle as a drop. The motor is used to aspirate the liquid and control the surface of the liquid in the nozzle. That is, both motor and piezoelectric actuator moves the piston. Pelc et al. fails to disclose this feature.

New claim 24, depending from claim 21, and claim 34, depending from claim 31, feature that the liquid is sucked into the inner space defined by the pipette and the piston in accordance with the position of the piston. On the other hand, in Pelc et al., the system liquid (not transfer liquid) is introduced into the syringe with plunger, as shown in Figs. 1 and 2 of the reference. In Fig. 7 of Pelc et al., the pressure control system 218 does not aspirate the system liquid, so that the transfer liquid is not introduced into the inner space defined by the pressure control system 218. Therefore, new claims 24 and 34 are totally different from the arrangement of Pelc et al.

New claim 25, depending from claim 21, and claim 35, depending from claim 31, feature that a position at which the piston fluid-tightly slides along the inner wall of the pipette is movable to the pipette along the inner surface. On the other hand, the position of fluid-tight

contact between the syringe 32 and the plunger 34 of Pelc et al. is fixed (at the tip of syringe) because there is no piston in syringe 32, as shown in Fig. 2 of Pelc et al. Therefore, new claims 25 and 35 are totally different from the arrangement of Pelc et al.

New claim 26, depending from claim 21, and claim 36, depending from claim 31, feature that the first speed is sufficiently low to prevent the air from entering the inner space through a space which would be made between the piston and the inner wall of the pipette while the liquid is sucked into the pipette. This is supported at page 7, line 10-17 of the present application. On the other hand, in Pelc et al., because there is no piston, the air does not enter the inner space through the space that would be made between the piston and the inner wall of the pipette while the liquid is aspirated. Therefore, claim 25 and 34 are totally different from the arrangement of Pelc et al.

New claim 27, depending from claim 21, and claim 37, depending from claim 31, feature that the supporting means supports the pipette holding means, the piston holding means, and the position changing means. This is supported at page 6, lines 11- 14 of the present application. Pelc et al. fails to this disclose this feature. Therefore, claims 26 and 35 are totally different from the arrangement of Pelc et al.

New claim 28, depending from claim 21, and claim 38, depending from claim 37, feature that the supporting means is capable of being hand-held. New claim 29, depending from claim 21, and claim 39, depending from claim 37, feature that the supporting means is capable of being hand-held by a robot arm. These features are supported at page 6, lines 11-22 of the present application. Pelc et al. fails to this close this feature. Therefore, claims 28, 29, 38, and 39 are totally different from the arrangement of Pelc et al.

New claim 30, depending from claim 21, and claim 40, depending from claim 31, feature that the pipette is replaceable with the pipette holding means, and the piston is replaceable with the piston holding means. Pelc et al. fails to disclose this feature. Therefore, claims 30 and 40 are totally different from the arrangement of Pelc et al.

New claim 41, depending form claim 31, features the motor controls the surface of the liquid in the nozzle after the piezoelectric actuator changes the position of the piston jets a portion of a liquid in the pipette through the nozzle. This is supported at page 10, line 12-15 of the present application. In other words, the liquid is jetted with the piezoelectric actuator, but the surface of the liquid in the nozzle is controlled with the motor. Pelc et al. fails to disclose this feature. Therefore, claim 41 is totally different from the arrangement of Pelc et al.

New independent claim 42 features that the liquid is sucked into the pipette with the position changing means through the nozzle without the attachable nozzle to speed up the sucking operation. Next, the attachable nozzle having a nozzle-cap nozzle is attached, and then, the position changing means is operated to jet a portion of the liquid in the pipette through the nozzle and nozzle-cap nozzle as a drop. Because both Pelc et al. in view of Kelly et al. fail to disclose this feature, new independent claim 42 is patentable over these references.

New independent claim 43 features that an inner space defined by the pipette and the piston is directly coupled to the nozzle. On the other hand, in the microvolume liquid handling system according to Pelc et al., the inner space defined by the syringe 32 and the plunger 34 in the positive displacement pump 12 is coupled to the nozzle 63 through the valve 38, the pressure sensor 14, and the distribution tubes 18, as shown in Fig. 1 of Pelc et al. In Fig. 7 of Pelc et al., the pressure control system 218 is coupled to the nozzle through the system liquid reservoir 214, distribution tubes 234, sections 236, microdispensors 212 at least. Therefore, the pipetting

apparatus defined by new independent claim 43 is totally different from the arrangement of Pelc et al.

Moreover, the reference Pelc et al. fails to disclose the piston fluid-tightly sliding along an inner wall of the pipette. The reference Pelc et al. fails to disclose this feature.

New claim 44, depending from claim 43, includes features defined by claims 14, 15, 16, 17, and 20, which are different from Pelc et al., as mentioned above. Therefore, claim 44 is different from the arrangement of Pelc et al.

**NEW MATTER**

The amendment filed April 9, 2002 was objected to under 35 U.S.C. 132 because the Examiner maintained that it introduces new matter into the disclosure. The Examiner stated, "The examiner fails to find support within the specification for the term "high speed signal" and "jetting means".

However, as described at page 6, lines 18 to 20 of the present application, the driver 21 generates a drive signal in accordance with the control signal. The linear step motor 3 moves the shaft 4 along the axis of the shaft 4 in response to the drive signal from the driver 21. That is, the drive signal is supplied to the linear step motor 3.

Moreover, as described at page 6, line 24 to page 7, line 1 of the present application, the control unit 20 generates the control signal such that a pulse train signal to make the driver generate the drive signals to control the direction of movement and the speed and position the piston 2. That is, the control unit 20 controls the speed of the linear step motor with the pulse train signal (drive signal). Further, it is well known that the linear step motor drives the shaft 4 by a step in response to each pulse.

Moreover, as described at page 7, line 20 to page 8, line 1 of the present application, in response to a switch the control unit 20 generates the pulse signal of which pulse rate is relatively high to push the piston 2 by a short distance of about tens micron meters by the linear stepping motor 3 in step 120. This short position change of the piston 2 toward the nozzle 1a jets a drop 8a (a portion) of the liquid 8 through the nozzle 1a. The pulse signal includes pulses at a high pulse rate such that the piston 2 hits the liquid 8. The jetted drop 8a drops into the vessel 9.

That is, to jet a drop 8a of the liquid 8, the pulse signal must include pulses at a high pulse rate such that the piston hits the liquid 8. The high pulse rate of the pulse signal (drive signal) corresponds to a high speed signal for the linear step motor because the linear motor drives the shaft 4 in response to each pulse in the drive signal from the general knowledge.

This point will be described more specifically with reference Modern Dictionary of Electronics, Sixth Edition pp. 975-976, HOWARD W.SAMS & COMPANY. At item 4, there is explanation that a mechanical device which rotates by a fixed amount each time it is pulsed. Moreover, at item 5, there is explanation that a device which converts pulsating direct current into rotary mechanical motion. Each dc pulse rotates the stepper a certain fraction of one revolution. Further, at item 6, there is explanation that a bi-directional permanent-magnet motor which turns through one angular increment for each pulse applied to it. This is the explanation for the rotary step motor, but the linear step motor operates similarly, wherein the movement is not a predetermined amount of angle, but a predetermined linear movement. The explanation indicates that a step movement of the liner step motor is caused by a pulse. Thus, when high rate pulses are applied to the linear step motor, it corresponds to a high speed signal. That is, "high speed signal " is supported by the specification.

Here, as defined by claim 1, the first speed for sucking the liquid is defined relatively to the second speed for jetting the liquid. Therefore, in claim 1, the speeds are clearly defined.

The jetting means is supported at page 7, line 20 to page 8, line 1 of the present application. That is, the control unit 20 generates the pulse signal of which pulse rate is relatively high to push the piston 2 by a short distance of about tens micron meters by the liner stepping motor 3 in step 120. This short position change of the piston 2 toward the nozzle 1a jets a drop 8a (a portion) of the liquid 8 through the nozzle 1a. The pulse signal includes pulses at a high pulse rate such that the piston 2 hits the liquid 8. The jetted drop 8a drops into the vessel 9.

Moreover, the jetting is supported at page 8, line 23 to page 9, line 7, at page 10, lines 5 to 11, at page 12, line 21 to 24, at page 14, lines 1 to 10, at page 15, lines 16 to 20, and at page 16, lines 7 to 20 of the present application.

Jetting is well-known term. For example, the aircraft propelled by ejecting hot gas is known as a jet aircraft. In this sense, "jetting" means that the hot gas that is ejected by the hot gas has kinetic energy. In the jet aircraft, the reaction propels the aircraft. Similarly, the portion of the liquid is ejected by pressure in the pipette, and the nozzle converts the pressure energy into the kinetic energy of the liquid. A portion of the liquid is successively ejected. That is, the portion of the liquid is jetted through the nozzles, as described in the present specification.

However, in this response, claim 1 has been amended to avoid such definition. That is, claim 1 is amended to recite that the speed to jet a portion of liquid is higher than that for the liquid, and claim 13 is cancelled. Therefore, withdrawn of the no new matter is introduced and withdrawal of the objection under 35 US.C. 132 is respectfully solicited.

**REJECTION OF CLAIMS UNDER 35 U.S.C. § 112, FIRST PARAGRAPH**

Claims 1-5 are rejected under 35 U.S.C. 112 first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The Examiner stated, "The examiner fails to find support within the specification for the term "high speed signal" as disclosed in applicant's amended claims."

While it is believed that the high speed signal is supported in the specification, as mentioned above, claim 1 is amended to define the speed to jet a portion of liquid relative to that for sucking the liquid. This is supported at page 7, lines 12 to 14 and lines 25 to 26 of the present application. Therefore, claims 1-5 are believed to be supported by the specification, and thus, withdrawn of the rejection under 35 U.S.C. 112, first paragraph is respectively solicited.

**REJECTION OF CLAIMS UNDER 35 U.S.C. § 112, SECOND PARAGRAPH**

Claims 1-5 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Case law precedent has established that an analysis under 35 U.S.C. § 112 begins with a determination of whether the claims do, in fact, set out and circumscribe a particular area with a reasonable degree of precision and particularity. Claim language is viewed not in a vacuum, but in light of the teachings of the prior art and of the application disclosure as it would be interpreted by one possessing the ordinary level of skill in the art. ***In re Johnson***, 558 F.2d 1008, 194 USPQ 187 (CCPA 1977); ***In re Moore***, 439 F.2d 1232, 169 USPQ 236 (CCPA 1971).

A decision on whether a claim is invalid under this section of the statute requires a determination of whether those skilled in the art would understand what is claimed when the claim is read in light of the specification, ***Seattle Box Co. v Industrial Crating & Packing***, 731 F.2d 381, 385, 221 USPQ 568, 574 (Fed. Cir. 1984).

In determining definiteness, no claim may be read apart from and independent from the disclosure on which it is based. ***In re Cohn***, 169 USPQ 95, 98 (CCPA 1971); ***In re Kroekel***, 183 USPQ 610, 612 (CCPA 1974):

> ... claims are not to be considered in a vacuum, "but always in light of the teachings of the prior art and the particular application disclosure as it would be viewed by one possessing the ordinary level of skill in the pertinent art." When considered in light of the prior art and the specification, claims otherwise indefinite may be found reasonably definite.

The criticism of the claims is urged to be directed to breadth of scope and not indefiniteness. As such, the rejection improperly attempts to limit the scope of the claims by requiring additional limitations under the guise that such limitations are necessary to make the claims definite.

It is submitted that when the claim language is read in light of the specification, an artisan would readily understand what the metes and bounds of the invention are. It addition, it should be noted also that the disclosure need not recite the claim language in ***haec verba***. ***In re Smith***, 481 F2.d 910, 178 USPQ 620 (CCPA 1973).

The Examiner states, "The terms "high speed signal" and "jetting means" in claims (1, 6) and 13 respectively are a relative terms which renders the claim indefinite. While it is believed that "the high speed signal" and "jetting" are supported in the specification, as mentioned above, claim 1 is amended to define the speed to jet a portion of liquid relative to that for sucking the liquid.

In claim 1, term "short distance" is clearly defined because the short distance is determined in accordance with a desired amount of the jetted portion of the liquid. This is supported at page 9, lines 4-6 of the present application.

In view of the above, claims 1-5, as amended, are believed to be definite, and withdrawn of the rejection under 35 U.S.C. 112, second paragraph, is respectively solicited.

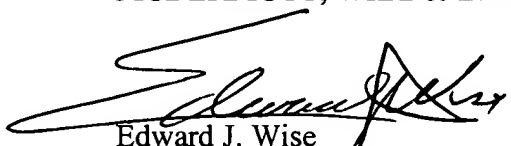
## CONCLUSION

Accordingly, it is urged that the application, as now amended, is in condition for allowance, an indication of which is respectfully solicited. If there are any outstanding issues that might be resolved by an interview or an Examiner's amendment, Examiner is requested to call Applicants' attorney at the telephone number shown below.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

MCDERMOTT, WILL & EMERY



Edward J. Wise
Registration No. 34,523

600 13th Street, N.W.
Washington, DC 20005-3096
(202) 756-8000 EJW:khb
Facsimile: (202) 756-8087
**Date: March 24, 2003**